AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-11. (cancelled)

12. (currently amended) ~~An orthopedic preformed material~~ An ultra high molecular weight polyethylene molded article for ~~subsequent~~ production of a medical implant with improved wear resistance, said ~~preformed material is a~~ article comprising an ultra high molecular weight polyethylene crosslinked by irradiation, and ~~thermally treated according to the method selected from the group consisting of: annealing and remelting~~ then heated at a temperature from its melting point minus 50°C to its melting point plus 80°C.

13. (currently amended) The ~~orthopedic preformed material~~ molded article of Claim 12, wherein said ~~preformed material~~ polyethylene is crosslinked by gamma radiation at a dose from ~~about~~ 1 to ~~about~~ 5 MR.

14. (currently amended) The ~~orthopedic material~~ molded article of Claim 12, wherein said ~~thermal treatment is remelting~~ heating is at a temperature of from the melting point of the ultra high molecular weight polyethylene to 80°C above said melting point.

15. (currently amended) The ~~orthopedic material~~ molded article of Claim 12, wherein said ~~thermal treatment~~ heating is at a temperature from 50°C below the melting point of the polyethylene to said melting point ~~annealing~~.

16. (cancelled)

17. (currently amended) ~~A medical implant having a bearing surface~~ An artificial joint, with improved wear resistance, ~~said bearing surface~~ comprising a solid ultra high molecular weight polyethylene which has been previously crosslinked by irradiation and ~~subsequently~~

~~remelted~~ then heated to a temperature from the melting point of the ultra high molecular weight polyethylene to 80°C above said melting point.

18. (cancelled)

19. (currently amended) The ~~medical implant~~ artificial joint of Claim ~~18~~ 17, wherein said polyethylene is crosslinked by gamma irradiation at a dose of at least ~~about~~ 1 MR.

20. (currently amended) The ~~medical implant~~ artificial joint of Claim 19, wherein said polyethylene is crosslinked by gamma radiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

21. (cancelled)

22. (currently amended) The ~~medical implant~~ artificial joint of Claim 17, wherein ~~a layer of the crosslinked and remelted~~ said crosslinked and heated polyethylene is ~~removed~~ cut during processing into an implant.

23. (currently amended) The ~~medical implant~~ artificial joint of Claim 17, wherein said ~~implant is a component for use in a joint prosthesis~~ artificial joint is an artificial hip joint or an artificial knee joint.

24. (currently amended) The ~~medical implant~~ artificial joint of Claim 23, ~~wherein said component is a bearing component~~ comprising an acetabular cup or a tibial insert.

25. (cancelled)

26. (currently amended) The ~~medical implant~~ artificial joint of Claim ~~25~~ 24, ~~wherein the implant is~~ comprising an acetabular cup.

27. (currently amended) ~~A medical implant having a bearing surface~~ An artificial joint with improved wear resistance, ~~said bearing surface~~ comprising a solid ultra high molecular

weight polyethylene which has been previously crosslinked by irradiation and ~~subsequently annealed~~ then heated at a temperature from its melting point minus 50°C to said melting point.

28. (cancelled)

29. (currently amended) A medical implant of Claim 27, wherein said polyethylene has previously been crosslinked by irradiation and subsequently isothermally treated at a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of time from ~~about~~ 1 hour to ~~about~~ 20 hours.

30. (cancelled)

31. (currently amended) ~~The medical implant~~ An artificial joint of Claim 27, wherein said polyethylene is crosslinked by gamma radiation at a dose of at least ~~about~~ 1MR.

32. (currently amended) ~~The medical implant~~ An artificial joint of Claim 31, wherein said polyethylene is crosslinked by gamma radiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

33. (currently amended) ~~The medical implant~~ An artificial joint of Claim 27, wherein ~~a layer of the crosslinked and annealed~~ said crosslinked and heated polyethylene is ~~removed~~ cut during processing into an implant.

34. (currently amended) The ~~medical implant~~ artificial joint of Claim 27, ~~wherein said implant is~~ comprising a component for use in a ~~joint prosthesis~~ hip joint or a knee joint.

35. (cancelled)

36. (currently amended) The ~~medical implant~~ artificial joint of Claim ~~35~~ 27, wherein said ~~joint prosthesis~~ artificial joint is selected from the group consisting of: hip and knee joints ~~prostheses~~.

37. (currently amended) The ~~medical implant~~ artificial joint of Claim 36, ~~wherein the implant is~~ comprising an acetabular cup.

38. (currently amended) A method for increasing the wear resistance of ~~a preformed~~ ultra high molecular weight polyethylene comprising the steps of:

(a) crosslinking said ultra high molecular weight polyethylene by irradiating it ~~in a solid state~~ below its melting point; and then

(b) ~~subjecting~~ heating the crosslinked ultra high molecular weight polyethylene ~~to thermal treatment which is selected from the group consisting of: annealing and remelting~~ at a temperature from its melting point minus 50°C to said melting point plus 80°C.

39. (previously presented) The method of Claim 38, wherein said crosslinking is by gamma irradiation.

40. (currently amended) The method of Claim 39, wherein the gamma irradiation is at a dose of at least ~~about~~ 1 MR.

41. (currently amended) The method of Claim 40, wherein the gamma irradiation is at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

42. (cancelled)

43. (currently amended) The method of Claim 38, wherein said thermal treatment comprises heating said polyethylene to a temperature between ~~about~~ 50° C below the melting temperature of said irradiated preformed ~~polymer~~ polyethylene and ~~about~~ the melting temperature of said irradiated preformed polyethylene.

44. (currently amended) The method of Claim 38, ~~wherein said thermal treatment comprises~~ additionally comprising heating said polyethylene to a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

45. (cancelled)

46. (currently amended) A method for increasing the wear resistance of an ~~orthopedic preformed polyethylene polymer~~ ultra high molecular weight polyethylene molded article, comprising the steps of:

(a) crosslinking ~~the preformed polyethylene polymer~~ said article by irradiating it ~~in a solid state~~ below its melting point; then

(b) ~~subjecting~~ heating the crosslinked ~~preformed polymer to thermal treatment which is selected from the group consisting of: annealing and remelting~~ article at a temperature from its melting point minus 50°C to its melting point plus 80°C; and then

(c) ~~removing the surface of the thermally treated crosslinked preformed polymer wherein said polymer is polyethylene~~ cutting the heated, crosslinked article.

47. (cancelled)

48. (currently amended) The method of Claim 46, wherein said ~~polyethylene~~ article is crosslinked by gamma radiation at a dose of at least ~~about~~ 1 MR.

49. (currently amended) The method of Claim 48, wherein said ~~polyethylene~~ article is crosslinked by gamma radiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

50. (currently amended) The method of Claim 46, wherein said ~~polyethylene~~ article is ~~re~~melted at a temperature from the melting temperature of the irradiated polyethylene to ~~about~~ 80° C above the melting temperature of said irradiated polyethylene.

51. (currently amended) The method of Claim 46, wherein said ~~polyethylene~~ article is heated to a temperature between ~~about~~ 50° C below the melting temperature of said irradiated

~~preformed polyethylene~~ article ~~below~~ and the melting temperature of said irradiated ~~preformed polyethylene~~ article.

52. (currently amended) The method of Claim 46, wherein said ~~thermal treatment~~ heating comprises heating said ~~polyethylene~~ article to a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

53. (currently amended) A method for increasing the wear resistance of an ~~preformed polymer~~ ultra high molecular weight molded article, comprising the steps of:

(a) crosslinking said ~~preformed polymer~~ article by irradiating it ~~in its solid state~~ below its melting point; and then

(b) ~~remelting~~ heating said crosslinked ~~polymer, said polymer being polyethylene~~ article at a temperature from its melting point to its melting point plus 80°C.

54. (cancelled)

55. (cancelled)

56. (currently amended) The method of Claim 53, wherein the ~~preformed polymer~~ article is crosslinked by gamma radiation at a dose of at least ~~about~~ 1 MR.

57. (currently amended) The method of Claim 56, wherein the ~~preformed polymer~~ article is crosslinked by gamma radiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

58. (currently amended) ~~A preformed polyethylene~~ An ultra high molecular weight polyethylene molded article made according to a method comprising the steps of:

(a) crosslinking a starting ultra high molecular weight polyethylene by irradiating it ~~in a solid state~~ below its melting point to form a crosslinked ultra high molecular weight polyethylene; and then

(b) ~~subjecting~~ heating the crosslinked ultra high molecular weight polyethylene at a temperature from its melting point minus 50°C to its melting point plus 80°C; ~~to thermal treatment which is selected from the group consisting of: annealing and remelting;~~

wherein said ~~preformed polyethylene~~ article has improved wear resistance over untreated ultra high molecular weight polyethylene.

59. (currently amended) The ~~preformed polyethylene~~ article of Claim 58, wherein said crosslinking is by gamma irradiation.

60. (currently amended) The ~~preformed polyethylene~~ article of Claim 59, wherein said gamma irradiation is at a dose of ~~from~~ at least ~~about~~ 1 MR.

61. (currently amended) The ~~preformed polyethylene~~ article of Claim 60, wherein said gamma irradiation is at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

62. (cancelled)

63. (currently amended) The ~~preformed polyethylene~~ article of Claim 58, wherein said ~~thermal treatment~~ heating comprises heating said crosslinked polyethylene to a temperature between ~~about~~ 50° C below the melting point of said irradiated polyethylene and the melting temperature of said irradiated polyethylene.

64. (currently amended) The ~~preformed polyethylene~~ article of Claim 58, wherein ~~whenever~~ said ~~thermal treatment~~ heating additionally comprises heating said polyethylene to a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

65. (cancelled)

66. (currently amended) ~~A preformed polyethylene polymer~~ An ultra high molecular weight molded article made according to a method comprising the steps of:

(a) crosslinking a starting ultra high molecular weight polyethylene polymer by irradiating in the presence of oxygen ~~in a solid state~~ to form a crosslinked polymer;

(b) ~~subjecting~~ heating said crosslinked polymer to a temperature from 50°C below the melting point of the polyethylene to 80°C above said melting point ~~thermal treatment selected from the group consisting of: annealing and remelting the crosslinked polymer~~; and

(c) ~~removing the oxidized surface of~~ cutting the heated crosslinked polymer.

67. (cancelled)

68. (currently amended) The ~~preformed polymer~~ molded article of Claim ~~67~~ 66, wherein said crosslinking is by gamma irradiation at a dose of at least ~~about~~ 1 MR.

69. (currently amended) The ~~preformed polymer~~ molded article of Claim 68, wherein said crosslinking is by gamma irradiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

70. (currently amended) ~~A preformed polymer~~ An ultra high molecular weight polyethylene article made according to the method comprising the steps of:

(a) crosslinking a starting ultra high molecular polyethylene ~~polymer~~ by irradiating it ~~in a solid state~~ below its melting point to form a crosslinked ultra high molecular weight polyethylene ~~polymer~~; and then

(b) ~~remelting~~ heating the crosslinked ~~polymer, wherein said polymer is~~ polyethylene at a temperature from its melting point to its melting point plus 80°C.

71. (cancelled)

72. (cancelled)

73. (currently amended) The ~~preformed polymer~~ molded article of Claim 70, wherein said crosslinking is by gamma irradiation at a dose of at least ~~about~~ 1 MR.

74. (currently amended) The ~~preformed polymer~~ molded article of Claim 73 wherein said crosslinking is by gamma irradiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

75. (currently amended) An ~~implantable load bearing component~~ artificial joint component made by the process comprising the steps of:

(a) crosslinking ~~a preformed~~ an ultra high molecular weight polyethylene below its melting point ~~in its solid state~~; then

(b) ~~subjecting~~ heating the crosslinked polyethylene to a temperature from its melting point minus 50°C to its melting point plus 80°C ~~thermal treatment selected from the group consisting of: annealing and remelting~~; and then

(c) ~~fashioning~~ processing the ~~implantable bearing component from the~~ crosslinked and thermally treated polyethylene to make an artificial joint component.

76. (cancelled)

77. (currently amended) The ~~implantable bearing~~ component of Claim 75, wherein said polyethylene is crosslinked by gamma radiation at a dose of at least ~~about~~ 1 MR.

78. (currently amended) The ~~implantable bearing~~ component of Claim 77, wherein said polyethylene is crosslinked by gamma radiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

79. (currently amended) The ~~implantable bearing~~ component of Claim 75, wherein said heating is at a temperature from said melting to 80°C above said melting point ~~thermal treatment is remelting~~.

80. (currently amended) The ~~implantable bearing~~ component of Claim 75, wherein said polyethylene is heated to a temperature between ~~about~~ 50° C below the melting temperature of said irradiated ~~preformed~~ polyethylene below and the melting temperature of said irradiated ~~preformed~~ polyethylene.

81. (cancelled)

82. (cancelled)

83. (previously presented) The ~~implantable bearing~~ component of Claim ~~82~~ 75, wherein said ~~joint prosthesis~~ artificial joint is selected from the group consisting of: hip and knee joint prostheses.

84. (currently amended) The ~~implantable bearing~~ component of Claim 83, wherein ~~the implantable bearing~~ said component is an acetabular cup.

85. (currently amended) ~~A product~~ An artificial joint component made by the process comprising the steps of:

(a) crosslinking ~~a preformed polymer~~ an ultra high molecular weight polyethylene by irradiating it in a solid state; then

(b) ~~subjecting the crosslinked polymer to thermal treatment selected from the group consisting of: annealing and remelting~~ heating said polyethylene to a temperature from around 100°C to 130°C for a period of from 1 hour to 20 hours; and then

(c) ~~removing the oxidized surface of the crosslinked polymer; and~~

~~(d)~~ ~~fashioning the product from~~ processing the crosslinked and thermally treated ~~polymer; wherein said polymer~~ polyethylene to make an artificial joint component.

86. (cancelled)

87. (currently amended) The ~~product~~ component of Claim 85, wherein said ~~polymer~~ polyethylene is crosslinked by gamma radiation at a dose of at least ~~about~~ 1 MR.

88. (currently amended) The ~~product~~ component of Claim 87, wherein said ~~polymer~~ polyethylene is crosslinked by gamma radiation at a dose of from ~~about~~ 1 to ~~about~~ 5 MR.

89. – 103. (cancelled)

104. (currently amended) A method for making an ultra high molecular weight polyethylene (UHMWPE) article, for subsequent processing to make an artificial joint ~~a medical implant~~, comprising:

(a) irradiating a raw article comprising UHMWPE; and then

(b) heating said irradiated article to a temperature of from ~~about~~ 50° C below the melting point of said article to ~~about~~ 80° C above said melting point.

105. (currently amended) A method according to Claim 104, wherein said heating is at a temperature between ~~about~~ 50° C below the melting point of said article and said melting point.

106. (currently amended) A method according to Claim 105, wherein said heating is at a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

107. (currently amended) A method according to Claim 104, wherein said heating is at a temperature from ~~about~~ said melting point to ~~about~~ 80° C above said melting point.

108. (previously presented) A method according to Claim 104, wherein said temperature is a compression deformable temperature.

109. (previously presented) A method according to Claim 108, wherein pressure is applied during said heating step.

110. (currently amended) A method according to Claim 109, ~~wherein said article is~~ further comprising cooling said article and isothermally ~~heated~~ crystallizing said cooled article after said ~~pressure is applied~~ heating step.

111. (currently amended) A method according to Claim 110, wherein said isothermal ~~treatment~~ crystallizing comprises heating said article to a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

112. (previously presented) An ultra high molecular weight polyethylene article made by the process of Claim 104.

113. (currently amended) An article according to Claim 112 having a wear factor of less than ~~about~~ 9.6×10^{-7}.

114. (currently amended) A method for making an ultra high molecular weight polyethylene (UHMWPE) article which is suitable for subsequent processing to make an artificial joint ~~a medical implant~~, so as to improve the wear resistance properties of said article, comprising:

(a) irradiating a raw article comprising UHMWPE; and then

(b) heating said irradiated article to a temperature of from ~~about~~ 50° C below the melting point of said article to ~~about~~ 80° C above said melting point.

115. (currently amended) A method according to Claim 114, wherein said heating is at a temperature between ~~about~~ 50° C below the melting point of said article and said melting point.

116. (currently amended) A method according to Claim 115, ~~wherein said heating is~~ additionally comprising heating said irradiated article at a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

117. (currently amended) A method according to Claim 114, wherein said heating is at a temperature from ~~about~~ said melting point to ~~about~~ 80° C above said melting point.

118. (previously presented) A method according to Claim 114, wherein said temperature is a compression deformable temperature.

119. (previously presented) A method according to Claim 118, wherein pressure is applied during said heating step.

120. (previously presented) An UHMWPE article made by a process of Claim 114.

121. (currently amended) An UHMWPE article according to Claim 120 having a wear factor of less than ~~about~~ 9.6×10^{-7}.

122. (currently amended) A method of making a component for an artificial joint comprising ultra high molecular weight polyethylene (UHMWPE), comprising:

(a) irradiating a raw article comprising UHMWPE;

(b) heating said irradiated article to a temperature of from ~~about~~ 50° C below the melting point of said article to ~~about~~ 80° C above said melting point; and then

(c) processing said article to make said component.

123. (currently amended) A method according to Claim 122, wherein said heating is at a temperature between ~~about~~ 50° C below the melting point of said article and said melting point.

124. (currently amended) A method according to Claim 123, ~~wherein said heating is~~ additionally comprising heating said irradiated article at a temperature of from ~~about~~ around 100°C to ~~about~~ 130°C for a period of from ~~about~~ 1 hour to ~~about~~ 20 hours.

125. (currently amended) A method according to Claim 122, wherein said heating is at a temperature from ~~about~~ said melting point to ~~about~~ 80° C above said melting point.

126. (previously presented) A method according to Claim 122, wherein said temperature is a compression deformable temperature.

127. (previously presented) A method according to Claim 126, wherein pressure is applied during said heating step.

128. (previously presented) A component for an artificial joint, wherein said component is made by a process according to Claim 122.

129. (currently amended) A component for an artificial joint according to Claim 128, having a wear factor of less than ~~about~~ 9.6 x 10^{-7}.

130. (currently amended) A method for making an ultra high molecular weight polyethylene (UHMWPE) article, for subsequent processing to make an artificial joint ~~a medical implant~~, comprising:

(a) irradiating a raw article comprising UHMWPE; and then

(b) heating said irradiated article to a temperature of from ~~about~~ around 100° C to ~~about~~ 130° C for a period of at least ~~about~~ 1 hour.

131. (currently amended) A method according to Claim 130, wherein said heating step comprises heating said article for from ~~about~~ 1 hour to ~~about~~ 20 hours.

132. (previously presented) A method according to Claim 130, wherein said article is cooled at a constant rate after said heating step.

133. (currently amended) A method according to Claim 132, wherein said cooling is at a rate of ~~about~~ 1° C/minute.

134. (previously presented) A method according to Claim 130, additionally comprising a step, prior to said heating step, comprising applying pressure to said irradiated article at a deformation temperature.

135. (currently amended) A method according to Claim 134, wherein said deformation temperature is between ~~about~~ 50° C below the melting point of said article and said melting point.

136. (currently amended) A method according to Claim 134, wherein said deformation temperature is from ~~about~~ said melting point to ~~about~~ 80° C above said melting point.

137. (previously presented) A UHMWPE article made by a process according to Claim 130.

138. (currently amended) A UHMWPE article according to Claim 137 having a wear factor of less than ~~about~~ 9.6×10^{-7}.

139. (currently amended) A method of making a component for an artificial joint comprising ultra high molecular weight polyethylene (UHMWPE), comprising:

(a) irradiating a raw article comprising UHMWPE; and then

(b) heating said irradiated article to a temperature of from ~~about~~ around 100° C to ~~about~~ 130° C for a period of at least ~~about~~ 1 hour; and then

(c) processing said article to make said component.

140. (currently amended) A method according to Claim 139, wherein said heating step comprises heating said article for from ~~about~~ 1 hour to ~~about~~ 20 hours.

141. (previously presented) A method according to Claim 139, wherein said article is cooled at a constant rate after said heating step.

142. (currently amended) A method according to Claim 141, wherein said cooling is at a rate of ~~about~~ 1° C/minute.

143. (previously presented) A method according to Claim 139, additionally comprising a step, prior to said heating step, comprising applying pressure to said irradiated article at a deformation temperature.

144. (currently amended) A method according to Claim 143, wherein said deformation temperature is between ~~about~~ 50° C below the melting point of said article and said melting point.

145. (currently amended) A method according to Claim 143, wherein said deformation temperature is from ~~about~~ said melting point to ~~about~~ 80° C above said melting point.

146. (previously presented) A component for a medical implant made by a process according to Claim 139.

147. (previously presented) A component for a joint prosthetic device according to Claim 146.

148. (currently amended) A component for an artificial joint according to Claim 146 having a wear factor of less than ~~about~~ 9.6×10^{-7}.